duced in the patient, then it must first be possessed by the practitioner: "The power of healing released through a religious psychotherapy should be mediated by the minister of religion." If so, then, Mr. Weaver argues, the Christian Church must carry on the ministry of religious psychotherapy. Mr. Weaver's fundamental assumption, then, is: Be good (or get someone to make you good) and you won't be ill. It is a defect of his book, however, that he does not convince the reader of the truth of the assumption.

(3) Mr. Hobhouse's "Development and Purpose" is a contribution to philosophy, serious, solid, and certainly heavy. "The book completes a scheme which has occupied the writer for twenty-six years, and has been carried through successive stages in three previous works." But the scheme has come to be completed in a way which a quarter of a century ago Mr. Hobhouse did not foresee or intend. He has come to hold that in the process of evolution both mechanical causation and teleological causation are at work; and, what is more, that mechanical causation involves teleological causation—hence, according to Mr. Hobhouse, the "organic harmony" of the world process.

Intelligent action is truly purposive, that is to say it is teleological causation and is not resolvable into mechanical laws. The actual order of reality, he tells us, is determined by the impulse to realise the future: what we do now is determined by what we want to be or do in the future. But, if that is so, it seems to the reader as though no place were left for mechanical causation, no need for causes prior in time to their effects. Mr. Hobhouse, however, holds that mechanical causation involves teleological causation, *i.e.* apparently that there could be no cause prior in time to the effects unless there were causes which, being teleological, are not prior in time to their effects. From this it would seem that the source of the trouble lies in the assumption that causes must be in time; on that assumption causes must both be and not be prior in time to their effects.

Mr. Hobhouse, though he sees and says that in the more ultimate sense Reality is not in time, but time is in Reality, does not devote more than this single sentence to the way in which, as it seems to us, the notion of time refracts causation into mechanical and teleological causes. However, Mr. Hobhouse's services to the cause of philosophy are recognised by all interested in philosophy; and all will be glad that the University of Durham has, in recognition of those services, conferred upon him the honorary degree of D.Litt.

IRON AND STEEL METALLURGY.

(1) *Iron Making in Alabama.* Third Edition. By W. B. Phillips. Pp. 254+xxxi plates. (Alabama: The University, 1912.)

(2) *Iron and Steel: An Introductory Text-book for Engineers and Metallurgists.* By O. F. Hudson and Dr. G. D. Bengough. Pp. x+173. (London: Constable and Co., Ltd. 1913.) Price 6*s.* net.

IT would be difficult to find a better illustration of the wide range of subjects involved in the study of iron and steel than these two books. Whereas one deals mainly with the extraction of iron from its ores, the other is largely concerned with the properties of the recovered metal, and the subjects range from the mining of the ore and the washing of coal on the one hand, to the constitution of steel and the electrolytic theory of corrosion on the other.

(1) The book by Mr. Phillips is published by the Geological Survey of Alabama, and is of necessity somewhat statistical. It is seldom, however, that one finds statistics dealt with in such an interesting manner. The title of the book might more accurately and with advantage be described as "Iron and Steel Making in Alabama," for it includes an excellent account of the steel-works of the State, which are responsible for an annual output of nearly half a million tons of steel in all sections, from rails to wire.

The first part of the book deals exhaustively with the iron ores of Alabama, and a chapter is devoted to experimental work on concentration. Fluxes and fuels are then considered, and much useful information is given on coking practice and the employment of by-product coke ovens. Blast-furnace practice, as regards both coke and charcoal furnaces, is considered in detail, and the growth and development of the modern blast-furnace is traced from the year 1894 to 1910. This is followed by an excellent account of the steel-works and rolling-mills of the State, and finally there is a chapter on coal-washing. Not the least useful feature of the book is the large number of tables of statistics, and some reference must be made to the excellent series of illustrations, thirty in number, which are reproduced from photographs.

The extent of the iron and steel industry in Alabama may be gauged from the fact that in the year 1910 nearly five million tons of ore were mined and sixteen million tons of coal, of which five million tons were converted into coke. The production of pig-iron amounted to two million tons, and of steel half a million tons. Such an industry is of more than local importance, and

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Mr. Phillips's volume will be greatly appreciated not only by those who are connected with Alabama, but by all who are interested in the manufacture of iron and steel wherever it may be carried on.

(2) Mr. Hudson's book is one of a series of textbooks which are described as "introductory to the chemistry of the national industries." It is written in a clear and concise manner, and deals very ably with recent scientific investigations and theories regarding the constitution of iron and steel. The principles underlying the smelting of iron, the manufacture of wrought iron and steel, foundry practice, and such processes as case-hardening, welding, &c., are reviewed very briefly, but no attempt is made to treat these subjects from the manufacturing point of view, and this part of the book can scarcely be regarded as an introduction to the metallurgy of iron and steel, except for very elementary students. The book is intended primarily for those interested in the physico-chemical rather than the practical aspects of the subject, and this is clearly the intention of the author, who states in his preface that "practical details of the methods of production have been avoided almost entirely, in order that more attention may be devoted to such matters as an explanation of the constitution of steel and cast-iron, and the effects of mechanical and heat treatment on the properties of these alloys." In the later chapters these subjects have been very completely dealt with, and, together with the chapter on corrosion by Dr. Bengough, will be welcomed by many students of metallurgy.

OUR BOOKSHELF.

Ueber kausale und konditionale Weltanschauung und deren Stellung zur Entwicklungsmechanik. By Wilhelm Roux. Pp. 66. (Leipzig: W. Engelmann, 1913.) Price 1.50 marks.

PROF. ROUX makes game of Prof. Verworn's recent essay on the causal and the conditional outlook on the world, which was, we think, reviewed some months ago in NATURE. What is true in Verworn's essay is not new, and what is new is not true. The causal outlook, which has been in vogue "from the Stone age down to Verworn," is not to be superseded by a crude "conditionism." What is sound in Verworn's emphasis that the scientific task is to inquire into all the antecedent conditions is recognised by all investigators. The change proposed is verbal, for as soon as a process is set a-going, its conditions become active factors or causes. The complete conditions *are* the complete causes. Verworn lays great stress on what he calls the "effective equivalence" of the conditions of any process or result, but Roux cannot accept the phrase. Equally necessary the factors are, but certainly not equivalent.

In the study of development the *specifitas potentiae* of each of the various factors is well known. In vital processes the internal and the external conditions cannot be spoken of as equivalent, as Verworn proposes. The constitution of an ovum includes factors which determine a certain, within limits, typical result; the external conditions of oxygen, warmth, moisture, and so on, activate and sustain the development. Thus Roux distinguishes between "determining" and "realising" factors, and says that it is nonsense to speak of their "equivalence."

From time to time in his brilliant series of studies in "developmental mechanics" Roux has given a causal analysis of the known factors involved, distinguishing, for instance, between internal and external, determining and realising, necessary and "not necessary" factors; and he is entirely opposed to the false simplicity which Verworn's "conditionism" would suggest. There has been hard hitting on both sides, but perhaps it is instructive to remember that Verworn's life has been largely spent in the study of metabolism, and Roux's in the study of development—which is for him an "autophænesis," "a becoming-visible of manifoldness by the proper activity of the germ." J. A. T.

Brazil in 1912. By J. C. Oakenfull. Pp. viii + 498. (London: Robert Atkinson, Ltd., 1913.) Price 5*s*.

THIS is the fourth annual edition of an excellent handbook on Brazil. As usual, it is well and profusely illustrated, the large map of the country and the coloured frontispiece showing the precious stones of Brazil being especially good. The book deals in an interesting manner with the history and geography of Brazil; but the chapters on the anthropology and ethnography, the geology and palæontology, the mineralogy, and the agriculture of Brazil will appeal more directly to scientific readers.

The book is intended for free distribution, but duplicate and trade copies can be obtained at the price stated.

Teachers of geography will find it an interesting and valuable work of reference in the school library.

The Theory and Design of Structures. A Textbook for the Use of Students, Draughtsmen, and Engineers engaged in Constructional Work. By E. S. Andrews. Third edition. Pp. xii + 618. (London: Chapman and Hall, Ltd., 1913.) Price 9s. net.

THE first edition of this book was reviewed at some length in the issue of NATURE for March 18, 1909 (vol. lxxx., p. 64). The additions made to the present edition are incorporated in an appendix of some twenty-seven pages, and these include a note on Dr. Stanton's experiments on wind pressure. The notation in the chapter on reinforced concrete has been made to agree with that proposed by the Concrete Institute, and numerous exercises have been added to the volume.

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